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Conference Abstract

Brazilian Plant-Pollinator Interactions Network: definition of a data standard for digitization, sharing, and aggregation of plant-pollinator interaction data

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Abstract

Pollination is considered one of the most important processes for biodiversity conservation (Kremen 2005). Recently, the global community, by means of the Intergovernmental Platform of Biodiversity and Ecosystems Services (IPBES 2016), and also, the Convention on Biological Diversity (CBD 2002) recognized the importance of plant-pollinator interactions for ecosystems functioning and sustainable agriculture. The conservation of pollination depends of information about plant-pollinator interactions covering a great diversity of functional and taxonomic groups. Studies show that successful pollination can improve the amount and the quality of plant fecundation and fruit production (Kevan and Imperatriz-Fonseca 2002). However, the success of these actions depends on the knowledge on pollinators, their conservation and interactions with plants and the environment. In order to conserve and manage it, more information needs to be captured about plant-pollinator interactions.

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Primary data about pollinators is becoming increasingly available online and can be accessed at a number of websites and portals. Many initiatives have also been created to facilitate and to stimulate the dissemination of pollination data, and examples are the Inter-American Biodiversity Information Network - Pollinators Thematic Network - IABIN-PTN (www.biocomp.org.br/iabinptn) and the WebBee (www.webbee.org.br) (Saraiva et al. 2003).

One important aspect of this trend is the strong reliance on standardized data schemas and protocols (e.g. Darwin Core - DwC and TDWG Access Protocol for Information Retrieval - TAPIR, respectively) that allow us to share and aggregate biological data, among which pollinator data are included.

Although plant-pollinator interaction data are critically important to our understanding of the role, importance and effectiveness of (potential) pollinators, they cannot be adequately represented by the current standards for occurrence data (such as DwC). The ways that interaction data are recorded and stored worldwide, as well as their intended use are very diverse. They lack of a common protocol and data schema, that will allow us to aggregate them in web portals and eventually use them to build decision support systems for conservation and sustainable use in agriculture, needs to be addressed.

The IABIN-PTN adopted a simple solution to characterize and digitalize plant-pollinator interaction data based on DwC (Cartolano Júnior et al. 2007), allowing the digitalization of many Latin-american collections. Following that work, the Food and Agriculture Organization of the United Nations (FAO) produced a detailed survey of potential descriptors of plant-pollinators interactions. Although the ultimate goal of that work was to propose a data standard, that did not evolve (Cavalheiro et al. 2016). The FAO Global pollination project, adopted in Brazil the same simplified model used by IABIN to digitize plant-pollinator interaction data (Saraiva et al. 2010).

Recently many Brazilian scientists gathered around the Brazilian Plant-Pollinator Interactions Network (REBIPP - www.rebipp.org.br) with the aim of developing scientific and teaching activities in the field. The main goals of the network are: generate a diagnosis of plant-pollinator interactions in Brazil; integrate knowledge in pollination of natural, agricultural, urban and restored areas; identify knowledge gaps; support public policy guidelines aimed at the conservation of biodiversity and ecosystem services for pollination and food production; and encourage collaborative studies among REBIPP participants.

To achieve these goals the group has resumed those previous works done under the auspices of the IABIN and FAO projects, and a data standard is being discussed. The ultimate goal is to adopt a standard and develop a database of plant-pollinator data in Brazil to be used by the national community. This proposal of a data standard (depicted in Fig. 1) can serve as a starting point for the definition of a global data standard for plant-pollinator interactions under the TDWG umbrella.

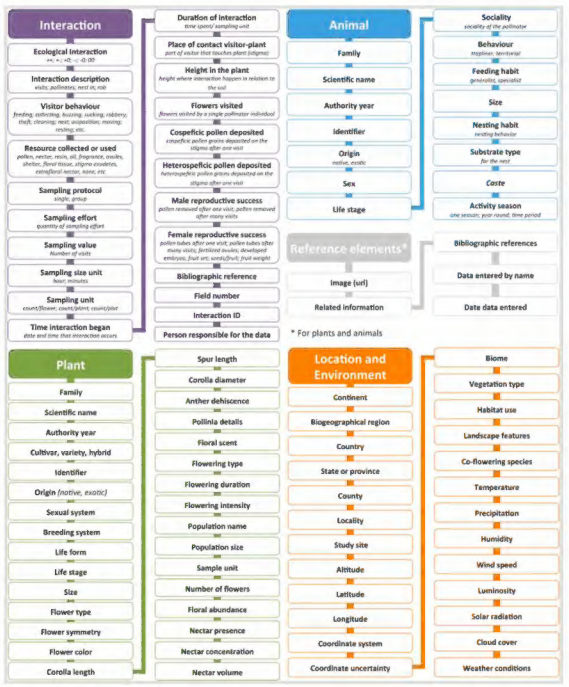

Figure 1.

Draft proposal of a plant-pollinator interaction data standard - data fields and categories.

Keywords

biotic interactions, pollination, pollinators, plant, data standard, Darwin Core

Presenting author

Antonio M. Saraiva

References

- Cartolano Júnior EA, Saraiva AM, Correa PL, Giannini TC, Giovanni R (2007) Uma proposta de esquema de dados de relacionamento entre espécimes. *XXXIII Conferencia Latinoamericana de Informática (CLEI 2007) e Taller Latinoamericano de Informática para la Biodiversidad (INBI 2007)*, San Jose.
- Cavalheiro LG, A.M. S, Gianinni TC (2016) Establishing Knowledge Management Systems for Ecological Interactions: the case of crop pollinators. In: Gemmill-Herren B (Ed.) Pollination Services to Agriculture: Sustaining and Enhancing a Key Ecosystem Service. Routledge
- CBD (2002) Report of the Sixth Meeting of the Conference of the Parties to the Convention on Biological Diversity. https://www.cbd.int/doc/meetings/cop/cop-06/official/cop-06-20-en.pdf. Accessed on: 2017-7-12.
- IPBES (2016) Preliminary guide regarding diverse conceptualization of multiple values of nature and its benefits, including biodiversity and ecosystem functions and services. draft 29. IPBES/3/INF/, 868 pp.

- Kevan P, Imperatriz-Fonseca VL (Eds) (2002) Pollinating bees: the conservation link between agriculture and nature. Ministry of Environment, Brasilia, 313 pp.
- Kremen C (2005) Managing ecosystem services: what do we need to know about their ecology? Ecology Letters 8 (5): 468-479. https://doi.org/10.1111/j.1461-0248.2005.00751.x
- Saraiva AM, Gemmill-Herren B, Ruggiero M (2010) A common schema for managing plant-pollinator interaction data. In: Food and Agriculture Organization of the United Nations (FAO) Report on progress for GEF/UNEP/FAO Project: “Conservations and management of pollinators for sustainable agriculture, through an ecosystem approach. 33 pp.
- Saraiva AM, Imperatrix-Fonseca VL, Cunha RS, Cartolano Júnior EA (2003) WebBee - a Web - based Information Network on Bees. Revista de Engenharia de Computação e Sistemas Digitais 1 (1): 77-85.